

CLAIMS

1. A method of forming a conductive line comprising the following steps:
forming a polysilicon layer;
forming a silicide layer against the polysilicon layer;
providing a conductivity-enhancing impurity within the silicide layer; and
providing the polysilicon layer and the silicide layer into a conductive line shape.

2. The method of claim 1 wherein the silicide comprises a metal selected from the group consisting of tungsten, titanium, molybdenum and cobalt.

3. The method of claim 1 wherein the steps of forming the silicide layer and providing the conductivity-enhancing dopant therein together comprise:
depositing a metal together with the conductivity-enhancing impurity on the polysilicon layer; and
reacting the metal with the polysilicon to form the silicide layer having the conductivity-enhancing impurity therein.

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~~4. The method of claim 1 wherein,
the step of forming the silicide layer comprises chemical vapor depositing silicide
on the polysilicon layer; and
the step of providing the conductivity enhancing impurity comprises chemical
vapor depositing the conductivity-enhancing impurity *in situ* with the chemical vapor
depositing of the silicide.~~

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5. The method of claim 1 wherein,
the step of forming the silicide layer comprises chemical vapor depositing a
tungsten-comprising silicide on the polysilicon;
the step of providing the conductivity-enhancing impurity comprises chemical
vapor depositing the conductivity-enhancing impurity *in situ* with the chemical vapor
depositing of the tungsten-comprising silicide; and
the conductivity-enhancing impurity comprises a group III or a group V element.

6. The method of claim 5 wherein the step of chemical vapor depositing the
conductivity-enhancing impurity comprises utilizing a precursor compound selected
from the group consisting of PH₃, AsH₃, and diborane.

7. The method of claim 1 wherein the conductivity-enhancing impurity is
provided to a concentration of at least about 1 x 10¹⁸ ions/cm³ within the silicide layer.

8. The method of claim 1 wherein the step of forming the silicide layer and the step of doping the silicide layer together comprise:

providing a target comprising a metal, silicon and the conductivity-enhancing impurity; and

sputtering of the target to form the silicide layer and the conductivity-enhancing impurity within the silicide layer, the silicide layer comprising the metal.

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9. The method of claim 1 wherein the step of providing the conductivity-enhancing impurity comprises:

ion implanting the conductivity-enhancing impurity into the silicide layer after forming the silicide layer.

10. The method of claim 1 wherein the polysilicon layer is doped with the conductivity-enhancing impurity, and wherein the step of providing the conductivity-enhancing impurity comprises:

out-diffusing the conductivity-enhancing impurity from the doped polysilicon layer into the silicide layer.

11. The method of claim 1 wherein the step of providing the conductivity-enhancing impurity comprises:

gas phase chemical doping of the silicide layer.

Mark C. Conrad 12. The method of claim 1 wherein the conductive line is a wordline.

Mark C. Conrad 13. (Amended) A method of lowering the resistivity of a metal-silicide layer comprising doping the metal-silicide layer with phosphorous.

Mark C. Conrad 14. The method of claim 13 wherein the dopant is provided to a concentration within the metal-silicide layer of at least about 1×10^{18} ions/cm³.

Mark C. Conrad 15. A method of forming a conductive line comprising the following steps: forming a polysilicon layer; forming a silicide layer against the layer of polysilicon; providing a conductivity-enhancing impurity within the silicide layer; and after providing the conductivity-enhancing impurity within the silicide layer, subjecting the silicide layer to a processing step of over 850°C for at least 10 seconds.

16. The method of claim 15 wherein the forming the silicide layer comprises depositing a metal layer over the polysilicon and reacting the metal layer with the polysilicon, and wherein the conductivity-enhancing impurity is provided within the metal layer prior to the reacting the metal layer with the polysilicon.

17. The method of claim 15 wherein the forming the silicide layer comprises depositing a metal layer over the polysilicon and reacting the metal layer with the polysilicon, and wherein the conductivity-enhancing impurity is provided within the metal layer after the reacting the metal layer with the polysilicon.

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18. The method of claim 15 wherein the conductivity-enhancing impurity is implanted into the silicide layer.

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19. The method of claim 15 wherein the conductivity-enhancing impurity is provided to a concentration within the silicide layer of at least about 1×10^{18} ions/cm³.

20. A method of forming a conductive line comprising the following steps: forming a polysilicon layer; forming a silicide layer against the layer of polysilicon; providing a conductivity-enhancing impurity within the silicide layer; and subjecting the silicide layer to a processing step of over 850°C for at least 10 seconds while exposing the silicide layer to an oxygen-comprising atmosphere.

Please add the following new claims:

29. (New) A method of forming a conductive line comprising:
forming a polysilicon layer;
forming a silicide layer over and proximately adjacent only the polysilicon layer;

and

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providing a conductivity-enhancing impurity within the silicide layer.

30. (New) The method of claim 29 further comprising exposing the silicide layer to an oxygen-comprising atmosphere.

31. (New) The method of claim 29 wherein the conductivity-enhancing impurity comprises phosphorous.

32. (New) The method of claim 29 further comprising providing a dopant within the polysilicon layer to a concentration of at least about 1×10^{19} ions/cm³.

33. (New) A method of forming a conductive line comprising:
providing a substrate;
forming a polysilicon layer over the substrate;
forming a silicide layer over the polysilicon layer and substrate; and
after the forming of the silicide, patterning the polysilicon and silicide layers to
form a conductive line.

34. (New) The method of claim 33 further comprising providing a conductivity-enhancing impurity within the silicide layer.

35. (New) The method of claim 34 wherein the providing of the conductivity-enhancing impurity is performed after the patterning of the polysilicon and silicide layers.

36. (New) The method of claim 34 wherein the providing of the conductivity-enhancing impurity is performed before the patterning of the polysilicon and silicide layers.

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